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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,930	06/26/2003	Robert L. Gerlach	F129	3850
25784	7590	10/05/2004	EXAMINER	
MICHAEL O. SCHEINBERG			QUASH, ANTHONY G	
P.O. BOX 164140			ART UNIT	
AUSTIN, TX 78716-4140			PAPER NUMBER	
			2881	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/606,930	Applicant(s) AK GERLACH ET AL.	
	Examiner Anthony Quash	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/30/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Priority

It is noted in applicants' oath/declaration, that the applicants' have listed prior provisional application 60/402,010. However, the applicants' have not indicated whether or not they are claiming priority to this application. Clarification is required.

Claim Objections

Claims 6-7,11, and 19-20 are objected to because of the following informalities:
The term "generally" in claim 6-7,11, and 19-20 is a relative term, which renders the claim indefinite. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by Kondo [2004/0061054]. As per claim 18, Kondo [2004/0061054] discloses a method of detecting positive or negative charged particles, comprising selectively attracting positive ions or electrons from a target, if positive ions are selectively attracted, converting the positive ions to electrons by causing the positive ions to impact on a surface, the impact causing the emission of electrons, and detecting using an electron detector either the electrons emitted by the impact of the positive ions from the surface or electrons selectively attracted from the target and not impacting the surface. See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo [2004/0061054]. As per claims 1, 13, 14, Kondo [2004/0061054] teaches a charged particle detector suitable for use in a focused ion beam system including a focused ion beam that can be directed to a target and that produces secondary particles upon impact of the ion beam with the target, the charged particle detector comprising, an input screen (the electrode 3, as viewed by the examiner for performing the equivalent

function) to which voltages can be selectively applied relative to the target so as to attract positive or negative secondary charged particles emitted from the target, and an ion-to-electron converter (340, DY1,DY2) including a material that emits electrons when impacted by charged particles from the target, wherein the converter is used with an electron detector to detect ions originating from a target by causing the ions to generate electrons to be detected by the electron detector, and having a structure such that when a first voltage is applied to the ion-to-electron converter, ions are attracted to the ion-to-electron converter collide with a surface of the ion-to-electron converter, and generate electrons that are detected by the electron detector, and when a second voltage is applied, electrons pass through the ion-to-electron converter and are detected by the electron detector. See Kondo [2004/0061054] abstract, figs. 3, 5,12, paragraphs [0002-0006,0014,0023-0025,0048-0049,0062-0063,0069-0071,0079-0087,0129,0154]. However, Kondo [2004/0061054] does not explicitly state a scintillator detector for detecting electrons originating at the target or electrons originating in the ion-to-electron converter (340,DY1, DY2). Instead Kondo [2004/0061054] shows that the compound substrate (1), which emits light upon being irradiating by an electron, light guide (2), and photomultiplier tube (10) is an equivalent structure known in the art. See Kondo [2004/0061054] abstract, figs. 3, 5,12, paragraphs [0048-0049, 0062-0063]. Therefore, because these two means for detecting electrons were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a compound semiconductor substrate, light guide (2), and photomultiplier tube (10) for the scintillator in applicants' invention.

As per claim 2, Kondo [2004/0061054] teaches the ion-to-electron converter being configurable in a first configuration to convert ions emitted from a target to electrons for detection by the scintillator detector (equivalent means as discussed in claim 1) and configurable in a second configuration to pass electrons from the target through the ion-to-electron converter for detection by scintillator detector (equivalent means as discussed in claim 1). See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154].

As per claim 3, Kondo [2004/0061054] teaches the ion-to-electron converter being configurable in the first configuration or the second configuration by altering one or more voltages on components of the ion-to-electron converter. See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154].

As per claim 4, Kondo [2004/0061054] teaches the apparatus further comprising a voltage source for applying a first voltage to the ion-to-electron converter for attracting positively charged ions from the target and causing the positively charged ions to impact the ion-to-electron converter and generate electrons for detection by the scintillator detector (equivalent means as discussed in claim 1) and for applying a second voltage to the ion-to-electron detector for passing electrons from the target through the ion-to-electron detector to scintillator detector (equivalent means as discussed in claim 1). See Kondo [2004/0061054] figs. 3, 5, paragraphs [0048-0049, 0062-0063, 0071, 0079-0087, 0129].

As per claim 5, Kondo [2004/0061054] teaches all aspects of the claim except for explicitly stating that the a voltage source for applying a first voltage to the input screen for attracting positively charged ions from the target and for applying a second voltage to the input screen for attracting positively charged ions from the target. Kondo [2004/0061054] does however teach means for attracting positively charged ions from the source. See Kondo [2004/0061054] fig. 5, and paragraphs [0081-0085]. Therefore it is the examiner's view that the Kondo [2004/0061054] fulfills aspect of providing a means for attraction positive ions by applying a voltage.

As per claims 6,16, Kondo [2004/0061054] teaches the ion-to-electron converter comprising parallel plates, the major planes of the plates being approximately parallel to the direction or motion of the incoming charged particles. See Kondo [2004/0061054] fig. 5.

As per claims 7,15, Kondo [2004/0061054] teaches all aspects of the claim except for explicitly stating the ion-to-electron converter comprising a hollow generally cylindrical structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ion-to-electron converter comprising a hollow generally cylindrical structure, since it has been held to be within the general skill of a worker in the art to select a known shape on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claims 8,17 Kondo [2004/0061054] teaches all aspects of the claim except for explicitly stating that the ion-to-electron converter comprises aluminum or stainless steel. It would have been obvious to one having ordinary skill in the art at

the time the invention was made to have the ion-to-electron converter comprises aluminum or stainless steel, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In addition, the examiner would like to state that it was well known in the art at the time the invention was made to have ion-to-electron converters be made from aluminum or stainless steel.

As per claim 9, Kondo [2004/0061054] teaches a focused ion beam system comprising an ion source, ion optics for focusing ions from the ion source into an ion beam and directing it towards a target; and a charged particle detector for detecting secondary positive ions or secondary electrons emitted from the target as a result of the impact of the ion beam. See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154].

As per claims 10, Kondo [2004/0061054] teaches the ion-to-electron converter being configurable in a first configuration to convert ions emitted from a target to electrons for detection by the electron detector and configurable in a second configuration to pass electrons from the target through the ion-to-electron converter for detection by the electron detector. See Kondo [2004/0061054] figs. 3, 5, and 12.

As per claim 11, Kondo [2004/0061054] teaches all aspects of the claim except for explicitly stating the ion-to-electron converter comprising a hollow generally cylindrical structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ion-to-electron converter comprising a hollow generally cylindrical structure, since it has been held to be within the general skill

of a worker in the art to select a known shape on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 12, As per claim 8, Kondo [2004/0061054] teaches all aspects of the claim except for explicitly stating that the ion-to-electron converter comprises aluminum or stainless steel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ion-to-electron converter comprises aluminum or stainless steel, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In addition, the examiner would like to state that it was well known in the art at the time the invention was made to have ion-to-electron converters be made from aluminum or stainless steel.

As per claim 19, Kondo [2004/0061054] teaches converting the positive ions to electrons by causing the positive ions to impact on a surface includes causing the positive ions to impact on a surface. See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154]. However, Kondo [2004/0061054] does not explicitly state that positive ions impact on a generally cylindrical surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the positive ions impact on a generally cylindrical surface, since it has been held to be within the general skill of a worker in the art to select a known shape on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 20, Kondo [2004/0061054] teaches converting the positive ions electrons by causing the positive ions to impact on a surface includes causing the positive ions to impact on the surface of a parallel plate. See Kondo [2004/0061054] fig. 5. However, it does not explicitly state that positive ions impact multiple parallel plates. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the ions impact on multiple parallel plates in order generate a larger number of secondary electrons.

As per claim 21, Kondo [2004/0061054] teaches converting the positive ions to electrons by causing the positive ions to impact on a surface. See Kondo [2004/0061054] abstract, figs. 3, 5, 12, paragraphs [0002-0006, 0014, 0023-0025, 0048-0049, 0062-0063, 0069-0071, 0079-0087, 0129, 0154]. However, Kondo [2004/0061054] does not explicitly state the positive ions impacting on a surface comprising aluminum oxide or stainless steel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the positive ions impacting on a surface comprising aluminum oxide or stainless steel, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In addition, the examiner would like to state that it was well known in the art at the time the invention was made to have ions impact aluminum oxide or stainless steel in order to generate secondary electrons in an ion-to-electron converter.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 4,322,629 to Eloy et al, 4,320,295 to Eloy, 3,894,233 to Tamura et al, 5,866,901 to Penn et al, and Japanese Patent No. 63071680 to Hiroyasu are considered pertinent to the applicants' disclosure. Eloy [4,322,629] and [4,320,295] are considered pertinent due to their discussion on an ion detectors. Tamura [3,894,233] is considered pertinent due to its discussion on an ion microprobe analyzer. Penn [5,866,901] is considered pertinent due to its discussion on an apparatus for and method of ion detection using electron multiplier over a range of high pressures. Hiroyasu [JP 63071680] is considered pertinent due to its discussion on an ion detector comprising an scintillator and screen.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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9/24/04



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